Intelligent Serial Interface

Models ISI3334/4
ISI3334/8

Intelligent Serial Interface Card with Integrated Data/Fax Modems

Quick Start Guide

MultiTech® Systems

Quick Start Guide

82085401 Revision B — 8/25/00

ISI3334-4/8

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Intelligent Serial Interface

Chapter 1 - Introduction and Description

MultiTech® Systems

Introduction

Welcome to the world of data communications. You have acquired one of the finest Intelligent Serial Interface cards available today, the MultiModemISI. The MultiModemISI integrates ISI mutiport and *Enhanced* V.34 modem technology on a single board. It is a "full sized" add-on card which supports a high-speed interface up to 115.2K bps per port. This card has multiple on-board *Enhanced* V.34 (33.6K bps) data/V.17 (14.4K bps) fax modems providing high speed buffering for multiple serial ports.

This User Guide contains product information specific to the modem aspect of this card (e.g., AT Commands and S-Registers), as well as hardware and driver installation procedures. Driver and hardware installation is also covered in the MultiModem ISI Quick Start Guide included in your shipping package.

Modem Features

Your MultiModemISI meets the proposed *Enhanced* V.34 ITU standard for data signalling rates as high as 33.6/ 31.2K bps full-duplex mode, and supports and is compatible with those features, including EIA extended Automode, adaptive line probing, automatic symbol rate and carrier frequency during start-up, and retrain and rate renegotiation (in 2400 bps increments).

Your MultiModemISI features CCITT V.42 error correction and V.42bis data compression, providing 100% error-free data transmission. V.42 error correction incorporates MNP Classes 3 and 4, and LAP-M. You may select V.42bis data compression for 4-1 throughput, or MNP Class 5 for 2-1 throughput.

Your MultiModemISI offers interactive automatic dialing, as well as Command Mode option configuration. You may store up to ten command line/telephone numbers, of up to 60 characters each, in the MultiModemISI's nonvolatile memory.

The MultiModemISI pulse or tone dials, and recognizes dial tones and busy signals for reliable call-progress detection. The MultiModemISI can detect AT&T calling card tones. It is FCC-Registered for connection to telephone networks without any Data Access Arrangements (DAA's).

Your MultiModemISI also features Remote Configuration which permits you to assist users at remote sites, saving you the time and trouble of site visits and preventing misinterpretation of configuration instructions.

Fax Features

Your MultiModemISI meets the CCITT V.17 standard for sending and receiving faxes. When linked to a compatible fax machine or modem, it can transmit faxes at 14.4 K bps. It also meets the CCITT's Group 3 Designation for sending and receiving faxes at 9600 bps; and Group 2 Designation for sending and receiving faxes at 4800 bps. The MultiModemISI is also downward-compatible to speeds as low as 300 bps, so it can send and receive faxes with virtually any fax machine in the world.

Product Description

The MultiModemISI is ideally suited to use in PC networks environments because it provides an integrated hardware solution for remote access for both Windows 95/98, Windows NT, Windows 2000 and Novell-based LANs. In particular, to ensure smooth Novell network integration, the MultiModemISI ships with NetWare Loadable Module for NetWare Connect™ communication servers that enable it to support state-of-the-art features such as remote dialing and modem pooling. And, the MultiModemISI easily integrates into the Windows 95/98, Windows NT and WIndows 2000 platforms since it fully supports Microsoft's Remote Access Server software. This allows it to operate with popular network protocols such as TCP/IP and NetBIOS. Also, the MultiModemISI ships with drivers for SCO Open Server 5®.

The MultiModemISI includes an Intel 16 MHz 80186 proccesor and 256K of RAM that work dynamically to allocate resources to the most active modems.

Simple to install, the MultiModemISI can be used to add multiport, *Enhanced* V.34 modem communications to a network host or server as easily as plugging in an expansion card, running the driver software, and connecting the phone lines.

Network managers have the option of starting with the basic four modem configuration (model #ISI334/4), and then adding four more modems at a later date without having to use another PC expansion slot.

This is accomplished by pairing one MultiModemISI with an auxiliary module (model #ISI3334/EC) interfacing both with on-board connectors.

Some MultiModemISI on-board components include one jumper block for activating the number of ports in increments of 4 or 8. One bank of 8 DIP-Switches for I/O address selection and one IRQ jumper block, that control both the MultiModemISI and auxiliary module I/O addressing and IRQ values.

When installing a single MultiModemISI in your PC, the installation scripts create 8 devices. The first 4 devices are active, however, the 4 devices on the auxiliary module are not active until connected to the MultiModemISI.

How to Use This Manual

This manual is divided into four chapters and six appendices. The information contained in each chapter and appendix is as follows:

Chapter 1 - Introduction and Description

Chapter 1 begins with a short product introduction and description; followed by a guide (which you are now reading) to the use of this manual.

Chapter 2 - Hardware and Driver Installation

This chapter will guide you through the installation of your MultiModem ISI card(s). This includes installation of your card and the loading of a driver that is specific to your operating system. In addition this chapter also gives descriptions of the Multi-Tech installation script and Multi_View Utility.

Chapter 3- "AT" Commands and S-Registers

This chapter focuses on the use of “AT” Commands and S-Registers. Chapter 3 provides basic steps for originating and answering calls and a summary of commands that enable the user to establish, read, and modify parameters in addition to dialing. Information on Remote Configuration commands is also provided in this chapter.

Chapter 4 - Service, Warranty & Technical Support/BBS

Chapter 4 provides instructions for getting the MultiModemISI serviced at the factory and warranty information. Includes instructions for accessing technical support via the Internet.

Appendices

Appendix A - Technical Specifications
Appendix B - ISI Testing Utilities
Appendix C - Tone Dial Frequencies
Appendix D - Regulatory Information
Appendix E - I/O Addressing
Appendix F - Auxiliary Module (ISI3334/EC) Installation

Intelligent Serial Interface

Chapter 2 - Installation

MultiTech Systems

Safety Warnings

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. This product is to be used with *UL* and *CUL* listed computers.
4. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
5. Use caution when installing or modifying telephone lines.
6. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
7. Do not use the telephone to report a gas leak in the vicinity of the leak.

Hardware Installation Summary

This section provides you with procedures for installing the MultiModemISI card(s) in your ISA or EISA bus personal computer (or compatible with 16 bit ISA slot).

Hardware installation involves:

1) Opening your PC.
2) Setting card configuration (determining I/O address DIP-Switch setting and IRQ jumper setting).
3) Installing the card into the PC.

Determining Current System Settings

When you install a device into your computer, the processor must have a means of routing information to and from the device and the device must have a means of gaining the processor's attention. These are called Input/Output (*I/O*) addresses and Interrupt Requests *(IRQs*), respectively. The MultiModemISI card requires 16 I/O addresses and one IRQ value which are not used by any other device in your system. When selecting a unique base I/O address, be sure that the next address is also unused. You can install up to four MultiModemISI cards into your system.

Each card is shipped with its IRQ set at level 10 and a base I/O address of 210 hex. Check your system's device settings to see if these values can be used. If the defaults are already in use, select a unique IRQ and I/O address and record those values for the hardware and software installation sections that follow. For more information on I/O addressing, see Appendix E.

Note: If you choose IRQ 3 or 4, you may have to disable a COM device from your BIOS setup. Also, most 386 or higher compatible computers will not be able to assign IRQ2 to the MultiModemISI card because IRQ2 is used for slave interrupt control.

Hardware Installation Procedure

Perform the following procedures to install the MultiModemISI card(s) into your PC-ISA bus computer. Installation procedures include setting the I/O address switch block and the IRQ jumper. If you have selected the default values of: **I/O Address 210 Hex and IRQ 10**, certain steps may be unecessary. However, if you are installing multiple cards, step 4a of the following procedure describes how to configure your card(s).

Installation Procedure

Step	Procedure

1 Make sure your computer and any peripheral equipment connected to it are turned off. Failure to do so may damage both your ISI card(s) and your PC. The MultiModemISI may be installed in a PC-AT, 386, 486, or Pentium equivalent ISA or EISA bus computer.

2 Remove the cover of your computer as instructed in your computer's documentation.

3 Locate the unused slot(s) which you will be using for your MultiModemISI card(s), and remove the slot cover(s) per the instructions in your computer's documentation.

4 Check the settings of the I/O address switch and the IRQ jumper to ensure that they are set properly for your installation.

Note: One MultiModemISI can be paired with an auxiliary module (model #ISI3334/EC) when it interfaces with on-board connectors attaching both cards; effectively providing 8 modem functionality. For details on this process, see Appendix F.

4a The default setting for the MultiModemISI's base I/O address is 210 hex. The default value for the IRQ jumper is IRQ 10. Choose the IRQ value by covering the appropriate pins with the shorting plug (supplied). If your system requires a different setting or if you are installing multiple cards, refer to Appendix E for a table of valid address settings.

5 Install the MultiModemISI card(s) into the selected expansion slot(s) in the same manner as any other add-on card, as instructed in your computer's documentation.

6 Fasten the retaining bracket to the computer chassis and replace the cover.

7 Your MultiModemISI card(s) requires a modular *LINE JACK*. This is typically an RJ11C or RJ11W jack, but could also be an RJ12 or RJ13 jack. To connect the modem(s) to the PSTN line(s), plug one end of the RJ11 cable(s) that is provided with the modem into the **LINE JACK** connector(s) and the other end into the phone-company-provided RJ11C or RJ11W modular phone jack(s).

Note: Any cables connected to the computer must be shielded to reduce interference.

8 Turn power on to the computer and proceed to the next section, *Driver Installation*, to install the MultiModemISI drivers.

Software/Driver Installation

Introduction

This chapter describes software/driver installation for the ISI cards when used in Windows 2000, Windows NT4, Windows NT3.51, Windows 95/98, Novell Netware, Linux, and SCO Open Server 5 (with informationon the MultiTech Installation Script and other SCO-related utilities). We also describe installation of MultiTech's Management Software for use with ISI cards under Windows 2000.

The process of installing a device driver consists of a modification to your system. For this reason, only the "*super user*" (system administrator) is allowed to perform the installation. If you cannot login as the **root**, **supervisor** or **admin** you must find the person in your organization who has this authorization (i.e., password). To begin the driver installation, login as **root**, **supervisor** or **admin**. Then proceed with the appropriate section.

Installing ISI3334 Software for Windows 2000

1. Turn off the PC.
2. The ISI3334 card must already be installed in an ISA expansion slot in the PC. If it is not, follow the PC manufacturer's instructions concerning installation of expansion cards. Observe standard precautions regarding electro-static discharge (ESD) when handling the ISI3334 board (the board should be kept in its shipping bag until used). During installation, handle the ISI3334 circuit card by its edges and keep one hand in contact with the PC chassis. Set the Base I/O Address and the Interrupt Request (IRQ) values per the table below:

Recommended Base I/O Address and IRQ Values

ISI3334	Base I/O Address	IRQ
Initial 8 port board	210h	10
First 8 port upgrade	220h	11
Second 8 port upgrade	230h	12
Third 8 port upgrade	240h	15

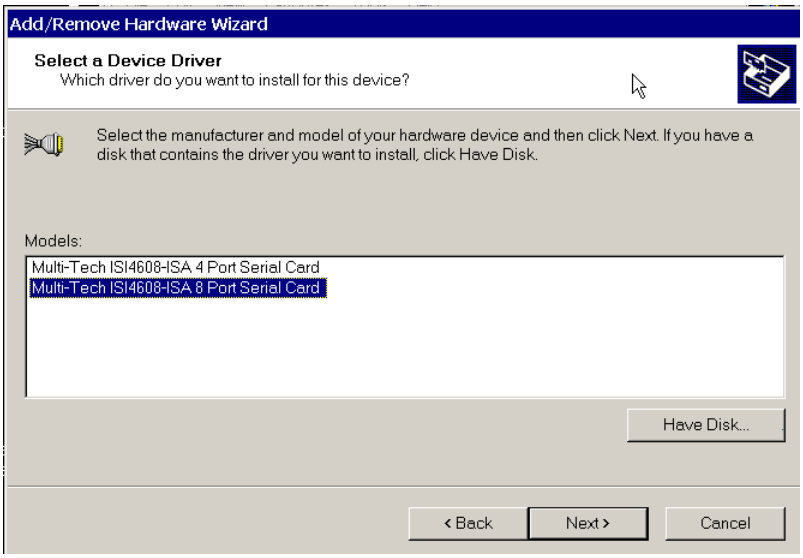
The I/O Address DIP Switch and the IRQ Jumper Block are located in the corner of the card that lies diagonally across from the ISA bus.

3. Turn on the PC and start Windows 2000.
4. Insert the diskette containing the driver files for Windows 2000 into the floppy drive (the driver files may be on CD-ROM instead).
5. Go to **Start | Settings | Control Panel | Add/Remove Hardware**.

   Click **Next**.

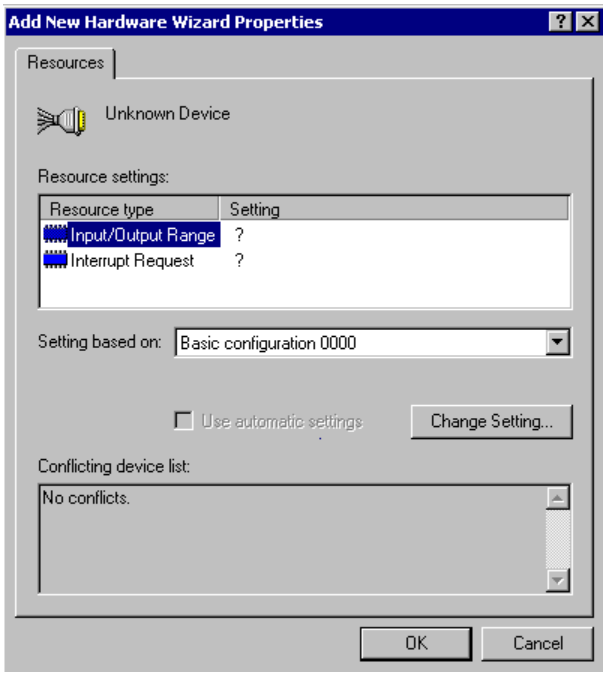
6. At the **Choose a Hardware Task** screen, select "Add/Troubleshoot a device." Click **Next**.
7. At the **Choose a Hardware Device** screen, select "Add a new device." Click **Next**.
8. At the **Find New Hardware** screen, select "No, I want to select the hardware from a list." Click **Next**.
9. At the **Hardware Type** screen, select "Multi-port serial adapters." Click **Next**.
10. At the **Select a Device Driver** screen, click on **Have Disk**.
11. At the **Install from Disk** screen, enter the path of the driver files (i.e., the file directory location, in most cases on CD-ROM). Click **OK**.

12. In the **Models** list, highlight "Multi-Tech ISI4608-ISA 4 Port Serial Card" for ISI3334-4 or "Multi-Tech ISI4608-ISA 8 Port Serial Card" for ISI3334-8. Click **Next**.

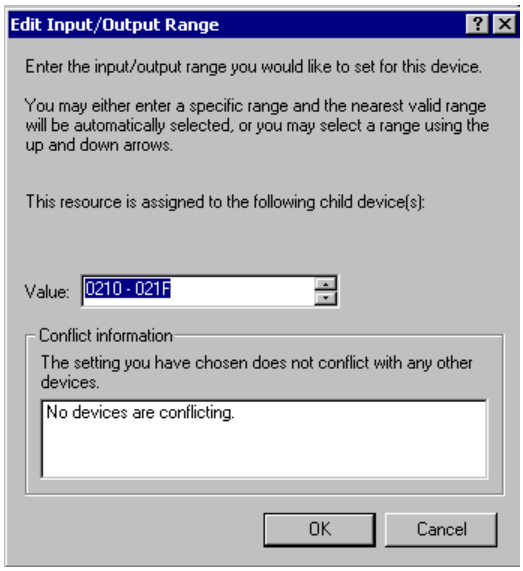

Add/Remove Hardware Wizard
Select a Device Driver
Which driver do you want to install for this device?
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Models:
Multi-Tech ISI4608-ISA 4 Port Serial Card
Multi-Tech ISI4608-ISA 8 Port Serial Card
Have Disk...
< Back
Next >
Cancel

A comment screen appears indicating that the Base I/O Address and IRQ must be specified for the ISI3334 card. Click **OK**.

13. The **Add New Hardware Wizard Properties** screen appears.

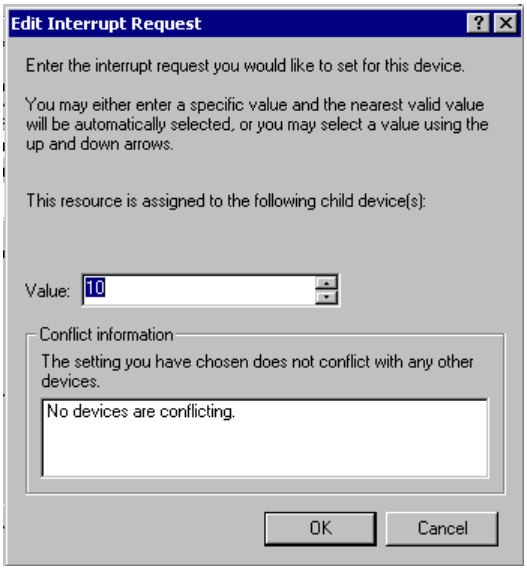


A. In the **Resource Settings** field, select "Input/Output Range" and click on Change Setting. The **Edit Input/Output Range** screen appears.


Edit Input/Output Range
Enter the input/output range you would like to set for this device.
You may either enter a specific range and the nearest valid range will be automatically selected, or you may select a range using the up and down arrows.
This resource is assigned to the following child device(s):
Value:
0210 - 021F
Conflict information
The setting you have chosen does not conflict with any other devices.
No devices are conflicting.
OK
Cancel

Select the value that matches the Base I/O Address value that you have already set on the ISI3334 board in Step 2. Click **OK**.

B. In the **Resource Settings** field, select "Interrupt Request" and click on **Change Setting**. The **Edit Interrupt Request** screen appears.


Edit Interrupt Request
Enter the interrupt request you would like to set for this device.
You may either enter a specific value and the nearest valid value will be automatically selected, or you may select a value using the up and down arrows.
This resource is assigned to the following child device(s):
Value:
10
Conflict information
The setting you have chosen does not conflict with any other devices.
No devices are conflicting.
OK
Cancel

Select the value that matches the IRQ value that you have already set on the ISI3334 board in Step 2. Click **OK**. At the **Resources** tab, click **OK** again.

14. At the **Start Hardware Installation** screen, click **Next**.
15. The **Digital Signature Not Found** screen appears. (Don't worry. This screen merely indicates that the ISI driver was created after the Windows 2000 native device list was created and was therefore not included. The ISI driver is, nonetheless, designed to operate in Windows 2000.) Click **Yes**.

    A transient progress screen appears while files are being copied.
16. A completion screen appears. Click **Finish**.
17. You will be prompted to restart your computer. Click **Yes**.

Installing Modems to COM Ports in Windows 2000

1. After the ISI driver has been installed and rebooting is complete, the ISI ports will be detected (the **Found New Hardware** screen will appear).

2. When all of the modem ports of the ISI3334 have been detected, the **Found New Hardware Wizard - Welcome** screen will appear. Click **Next**.

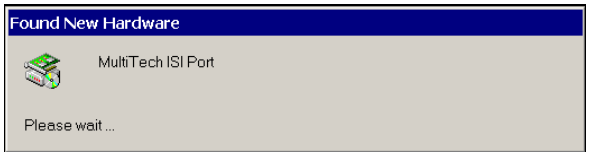
3. The **Install Hardware Device Drivers** screen will appear. Select "Search for a suitable driver ... ." Click **Next**.

4. The **Locate Driver Files** screen will appear. Select "CD-ROM drives ... ." Click **Next**.

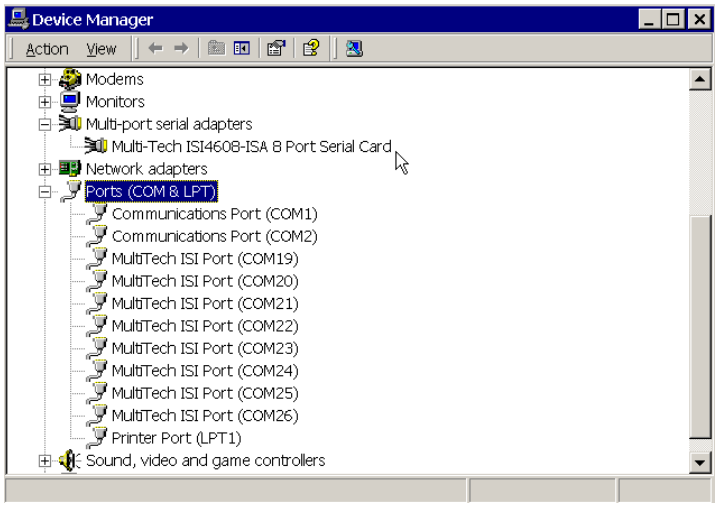
5. The **Driver Files Search Results** screen will appear. Click **Next**.

6. A completion screen will appear. Click **Finish**.

7. The **Found New Hardware** screen will appear repeatedly, once for each modem on the ISI3334 card (4 or 8 times, depending on the model).



8. To confirm the installation of the ISI3334 modems to COM ports, go to **Start** | **Settings** | **Control Panel** | **System**. Click on the **Hardware** tab. Click on the **Device Manager** button.



9. Installation of ISI3334 modems to COM ports is complete.

ISI3334 for Windows 2000: Installing ISI Management Software (server OSs only)

If you are using a Windows 2000 Server operating system ("Server" or "Advanced Server"), you must decide whether you want to use the MultiTech ISI Management Software in conjunction with your ISI3334 board. The ISI Management Software is shipped with the ISI card and, alternatively, can be downloaded from the MultiTech web site (www.multitech.com).

1. Turn on your computer and start Windows 2000.
2. Insert the CD-ROM or diskette containing the ISI Management Software into your CD-ROM or floppy drive.
3. Go to **Start | Run**. In the **Run** window, enter the file path at which the ISI Management Software setup program is located; for example `D:\MANAGEMENT\SETUP.EXE`.

   Click **OK**.
4. The **ISI Management** setup screen appears. At the **Welcome** screen, click **Next**.
5. A progress screen appears while files are copied. If the **Error Creating Virtual WWW Server** message appears, it may indicate that there was an attempt to install the ISI Management Software on a client version of Windows 2000. (The ISI Management Software can be installed only in the *Windows 2000 Server* and *Windows 2000 Advanced Server* operating systems.)
6. A completion screen appears. Select "Yes, I want to restart my computer now" and click **Finish**.

After the computer has restarted, the installation of the driver and of the ISI Management Software will be complete.

##?## begin insert ##?##

Remove ISI3334 Driver (Windows 2000)

1. Go to Start | Settings | Control Panel.
2. Click on **Add/Remove Hardware**. Click **Next**.
3. Click on “Uninstall/Unplug a device” and click **Next**.
4. In the subsequent screen, click on “Uninstall a device” and click **Next**.
5. At the **Add/Remove Hardware WIzard** screen, highlight the ISI driver file for the specific server card that you intend to remove. Click **Next**.
6. When you are asked to confirm removal, click on the **Yes** radio button and click **Next**.
7. Click **Finish**. You can remove the driver for only one ISI3334 card at a time.

ISI3334 Software Installation Procedure for Windows NT 3.51/4.0

1. Turn off the PC.

2. The ISI3334 card must be installed in an ISA expansion slot in the PC. If it is not already installed, install the ISI3334 card according to the PC manufacturer's instructions. Observe standard precautions regarding electro-static discharge (ESD) when handling the ISI3334 board (the board should be kept in its shipping bag until used). During installation, handle the ISI3334 circuit card by its edges and keep one hand in contact with the PC chassis. Set the Base I/O Address and the Interrupt Request (IRQ) values per the table below:

Recommended Base I/O Address and IRQ Values

ISI3334	Base I/O Address	IRQ
Initial 8 port board	210h	10
First 8 port upgrade	220h	11
Second 8 port upgrade	230h	12
Third 8 port upgrade	240h	15

The I/O Address DIP Switch and the IRQ Jumper Block are located in the corner of the card that lies diagonally across from the ISA bus.

3. Turn on the PC and start Windows NT.

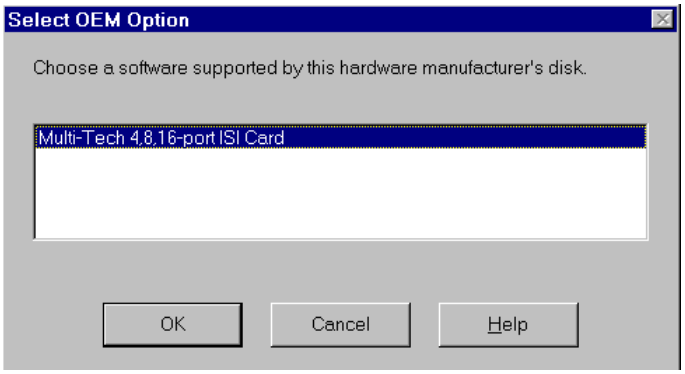
4. Insert the ISI driver CD-ROM into the CD-ROM drive. (In some cases, drivers may be downloaded from the MultiTech web site and saved onto diskette. If so, insert diskette into floppy driver now.)

5. Click **Start | Settings | Control Panel | Network | Adapters**. Then click **Add**.

6. The **Select Network Adapter** dialog box appears. Click **Have Disk**.

7. The **Insert Disk** dialog box appears. Type the path (file directory location) of the Windows NT driver. Click **OK**.

8. The **Select OEM Option** dialog box appears. Click **OK**.



A transient dialog box will appear indicating the progress of the setup program.

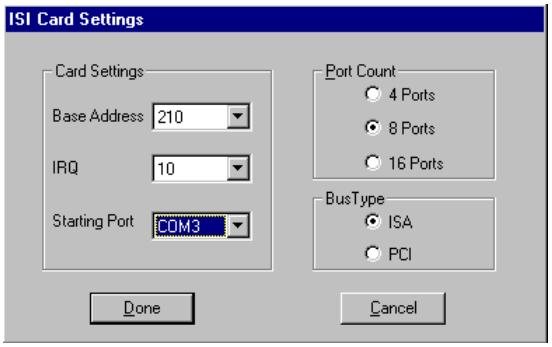
9. The **ISI Cards** dialog box appears. Click **Add**.

10. Then the **ISI Card Settings** dialog box appears. Enter the correct port count:

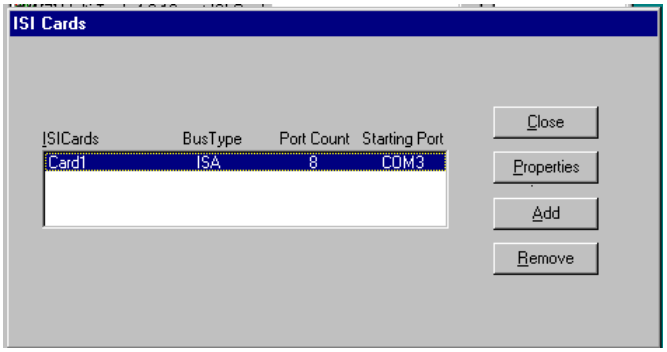
- allocate 4 ports for the ISI3334-4;
- allocate 8 ports for the ISI3334-8.

Select the first port number for ISI modems, which is usually COM3.

Click "ISA" in the **Bus Type** field. Enter the Base I/O Address and IRQ as in Step 2 above.

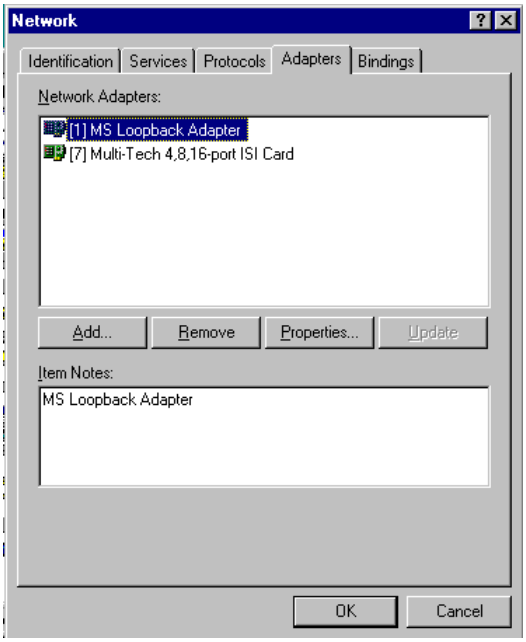


11. The **ISI Cards** dialog box appears again and shows the port resource allocation just made. To add more cards, click **Add** and repeat Step 9.



After the last ISI card has been added, click **Close**.

12. The file is copied and "Multi-Tech ISI3334 Adapter" or "Multi-Tech 4, 8, 16-port ISI Card" will appear in the **Network Adapters** box. Click **Close**.



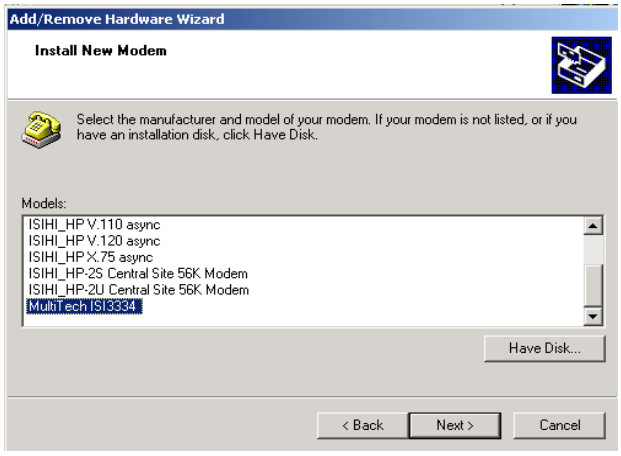
13. When prompted about restarting your computer, click **Yes**.

The ISI3334 card software is now installed in Windows NT.

Installing ISI3334 Modems to COM Ports in Windows NT

To install modems:

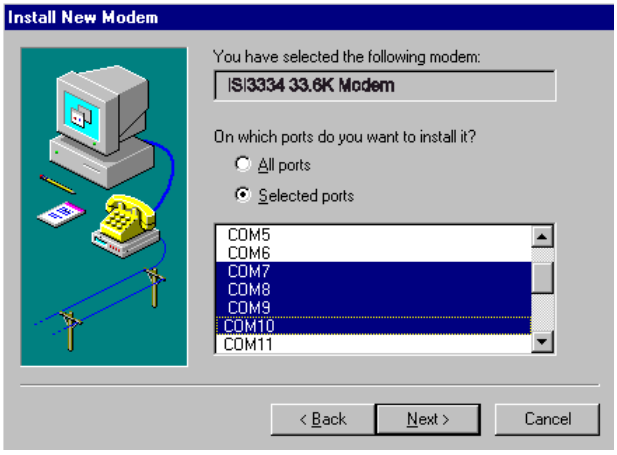
1. Go to **Start** | **Settings** | **Control Panel** | **Modems**. In the **General** tab of the **Modems Properties** dialog box, click **Add**.
2. The **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list.** Then click **Next**.
3. The **Install New Modem** dialog box appears. In the **Manufacturers** list, select "MultiTech Systems." From the **Models** list, select **MultiTech ISI3334**. Then click **Next**.


Add/Remove Hardware Wizard
Install New Modem
Select the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.
Models:
ISIHI_HP V.110 async
ISIHI_HP V.120 async
ISIHI_HP X.75 async
ISIHI_HP-2S Central Site 56K Modem
ISIHI_HP-2U Central Site 56K Modem
MultiTech ISI3334
Have Disk...
< Back
Next >
Cancel

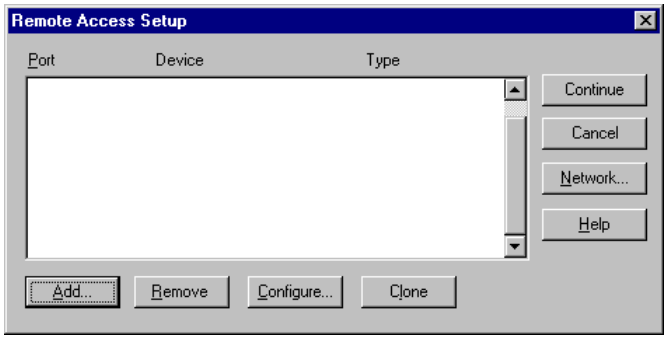
4. Select ports for modem use.

- For the ISI3334-4, you should have reserved 4 modem ports during driver installation.
- For the ISI3334-8, you should have reserved 8 modem ports during driver installation.

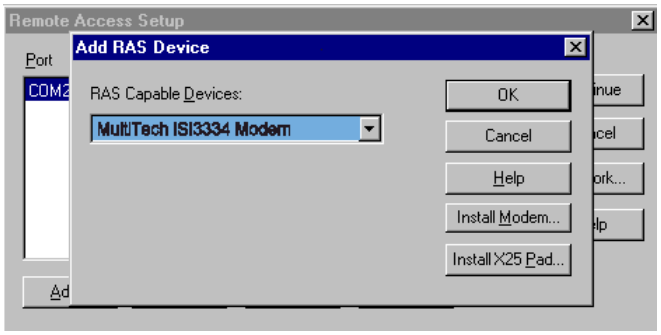
Click **Next**. The modems will be installed to the selected COM ports.



5. After the modems install to the ports, click **Finish** to return to the **General** tab.
6. To view COM port assignments and make necessary changes, use the **Modems Properties** dialog box (accessible from **Start | Settings | Control Panel | Modems)**.
7. Close the **Modems Properties** dialog box. You will be prompted to configure dial-up networking. Click **Yes**.
8. The **Remote Access Setup** dialog box appears. Click **Add**.

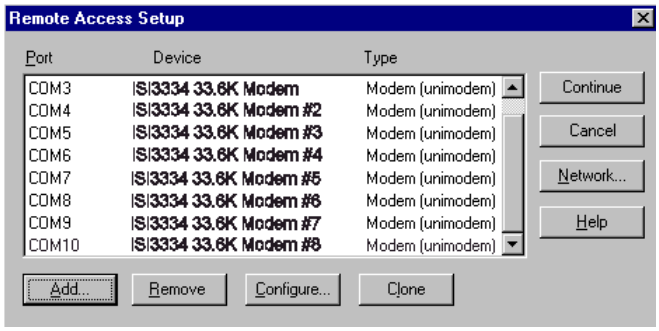


9. Each COM port appears in a separate **Add RAS Device** dialog box. To add the highlighted device, click **OK**.



10. The **Remote Access Setup** dialog box displays again. Repeat steps 7 - 9 until all devices are added.

11. When all devices have been added, click **Continue**.



12. After the bindings have been reviewed and stored, you will be prompted to restart your computer. Click **Yes**.

Removing ISI3334 Card and Driver in Windows NT 3.51/4.0

1. Go to **Start | Settings | Control Panel | Network**. Click on the **Adapters** tab.
2. Select "MultiTech 4, 8, 16-port ISI card," and then click **Remove**.

To complete the un-install procedure, restart your computer.

ISI3334 Software Installation Procedure for Windows 95/98

1. Turn off the PC.

2. The ISI3334 card must be installed in an ISA expansion slot in the PC. If it is not already installed, install the ISI3334 card according to the PC manufacturer's instructions. Observe standard precautions regarding electro-static discharge (ESD) when handling the ISI3334 board (the board should be kept in its shipping bag until used). During installation, handle the ISI3334 circuit card by its edges and keep one hand in contact with the PC chassis.

Set the Base I/O Address and the Interrupt Request (IRQ) values per the table below:

Recommended Base I/O Address and IRQ Values

ISI3334	Base I/O Address	IRQ
Initial 8 port board	210h	10
First 8 port upgrade	220h	11
Second 8 port upgrade	230h	12
Third 8 port upgrade	240h	15

The I/O Address DIP Switch and the IRQ Jumper Block are located in the corner of the card that lies diagonally across from the ISA bus.

3. Turn on the PC and start Windows 95/98.

4. Insert the ISI driver CD-ROM into the CD-ROM drive. (In some cases, drivers may be downloaded from the MultiTech web site and saved onto diskette. If so, insert diskette into floppy drive now.)

5. (Follow either 5A or 5B, but not both.)

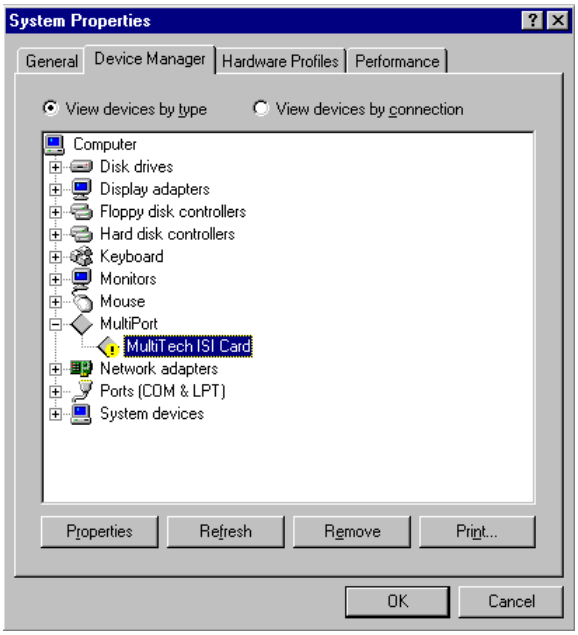
A. From Windows Explorer, open the **95-98** directory on the CD-ROM or floppy drive that contains the ISI driver file. Highlight the file **setup.exe**.

B. From the **Start** menu, go to **Run**. Browse to the path of the **95-98** directory.

6. Launch the setup program. (From Windows Explorer, double-click on **setup.exe**; from the **Run** menu, click **OK**.)
7. The installation wizard will begin running. At the **Welcome** screen, click **Next**.
8. In the **ISI Device Driver Setup** dialog box, under **Select Type of Card**, check the **Install ISA Card** box. Click **Next**.
9. The **ISI Card Port Count** dialog box appears.

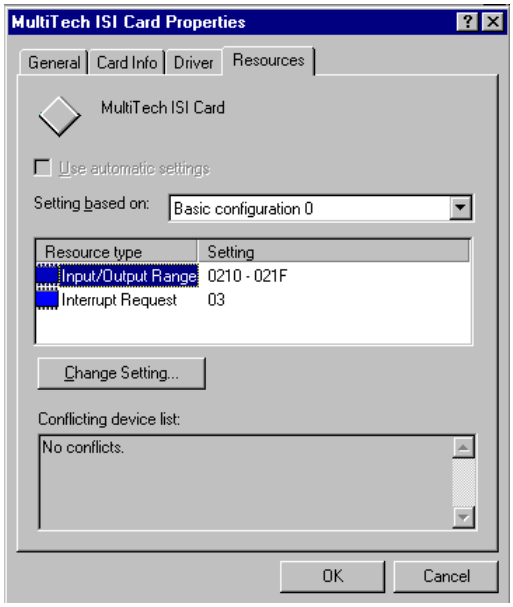
   For ISI3334-4, specify the number of ports on the card as **4**.
   For ISI3334-8, specify the number of ports on the card as **8**.

   Click **Next**.
10. The following message appears in the **ISI Driver Setup** dialog box: "Installing ISI ports. This will take a few minutes. Click OK to proceed." Click **OK**.
11. This completion message appears: "ISA card was successfully installed. You need to set the base address and IRQ for the card. Please select the MultiTech ISI Card under MultiPort in Device Manager and then select the Properties to change the settings." Click **OK**.
12. The **System Properties | Device Manager** screen appears. Highlight **MultiTech ISI Card**. Click **Properties**.

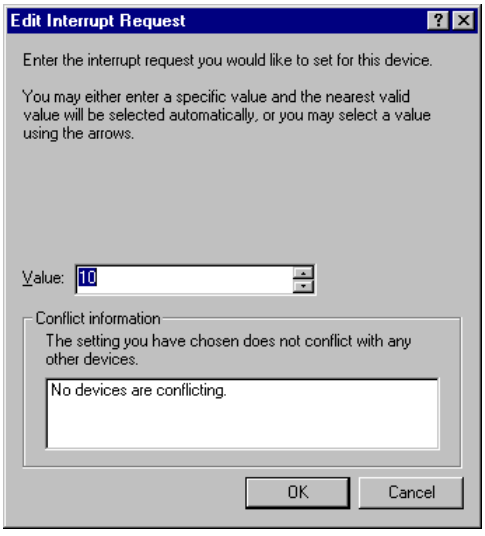


13. The **MultiTech ISI Card Properties** screen appears.
    Click on the **Resources** tab.

14. Click on **Set Configuration Manually**.



15. Set the "Input/Output Range" to match the Base I/O Setting that you specified on the hardware DIP switch in Step 2 above. Set the "Interrupt Request" to match the IRQ setting you specified on the hardware jumper block in Step 2 above. To alter these parameters, click on the **Change Setting** button.


Edit Interrupt Request
Enter the interrupt request you would like to set for this device.
You may either enter a specific value and the nearest valid value will be selected automatically, or you may select a value using the arrows.
Value:
10
Conflict information
The setting you have chosen does not conflict with any other devices.
No devices are conflicting.
OK
Cancel

16. When editing of IRQs and Base I/O Address settings is complete, click **OK**. Then click **OK** at the **Resources** screen.

The **System Settings Change** screen appears and prompts you to restart your computer. Click **Yes**.

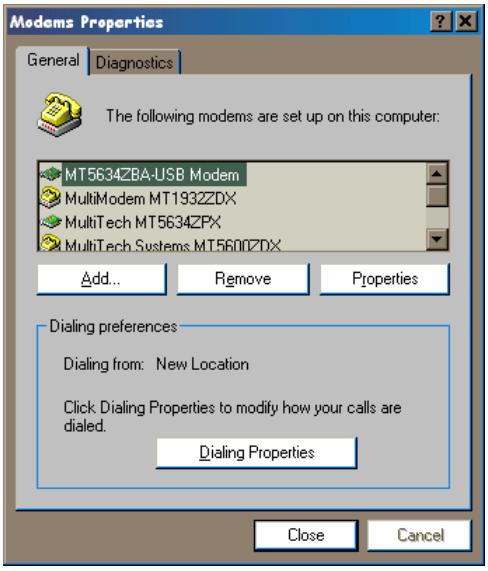
17. When prompted about re-starting your computer, click **Yes**.

18. When the computer is restarted, the software installation will be complete.

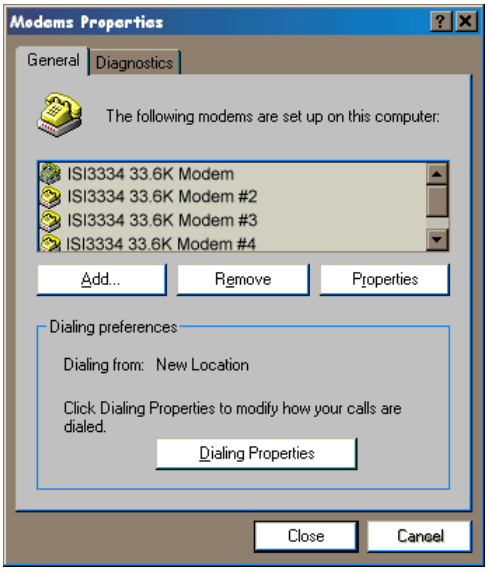
Installing ISI3334 Modems to COM Ports in Windows 95 /98

1. Click **Start**, **Settings**, **Control Panel**, and then double-click the **Modems** icon.
2. If no modems are currently installed, the **Install New Modem** dialog box appears. Check the box marked **Don't detect my modem; I will select it from a list.** Then click **Next**.

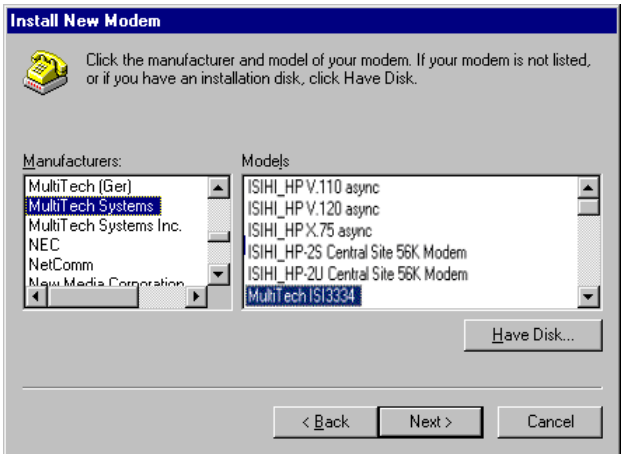
   If other modems have been installed, the **Modems Properties** dialog box will appear.



In the **General** tab of the **Modem Properties** dialog box, click **Add**.



3. The **Install New Modem** dialog box appears. Check the box marked "Don't detect my modem; I will select it from a list." Then click **Next**.
4. The **Install New Modem** dialog box appears. In the **Manufacturers** list, scroll down and highlight "MultiTech Systems." In the **Models** list, highlight the modem type used on the ISI board: "MultiTech ISI3334" Modem."

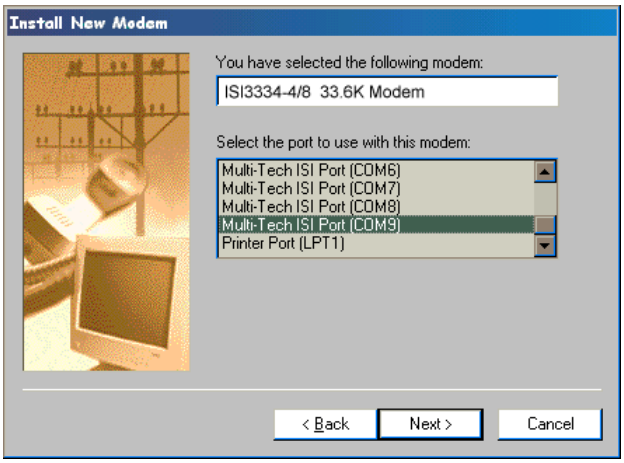


5. The **Install New Modem** dialog box appears. Select the numbered port corresponding to the first modem of the ISI card.

   For ISI3334/4, you would assign for modems four ports with numbers starting just above the highest numbered port already in use. In many case, this will be COM3, COM4, COM5, and COM6.

   For ISI3334/8, you would assign for modems eight ports with numbers starting just above the hightest numbered port already in use. In many cases, this will be COM3, COM4, COM5, COM6, COM7, COM 8, COM 9, and COM10.

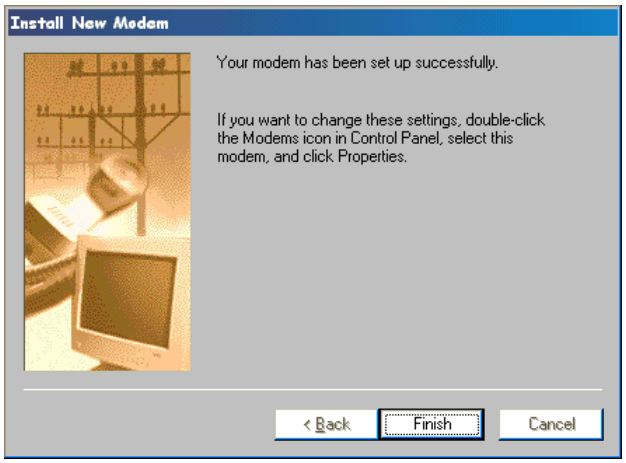
Click **Next**. The modem installs to the COM port.


Install New Modem
You have selected the following modem:
ISI3334-4/8 33.6K Modem
Select the port to use with this modem:
Multi-Tech ISI Port (COM6)
Multi-Tech ISI Port (COM7)
Multi-Tech ISI Port (COM8)
Multi-Tech ISI Port (COM9)
Printer Port (LPT1)
< Back
Next >
Cancel

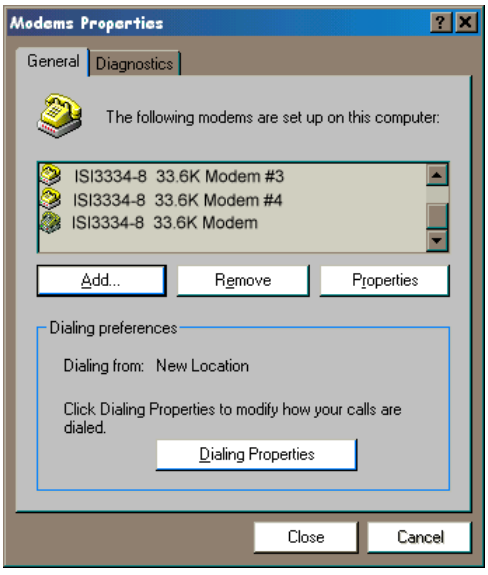
6. When installing the first ISI modem or terminal adapter, the **Location Information** screen will appear (it does not appear when additional modems or terminal adapters are installed). Fill in the appropriate area code and phone number information.

Location Information
Please provide information about your current location so that your calls can be dialed correctly.
What country are you in now?
United States of America
What area (or city) code are you in now?
If you dial a number to access an outside line, what is it?
The phone system at this location uses:
Tone dialing
Pulse dialing
< Back
Next >
Cancel

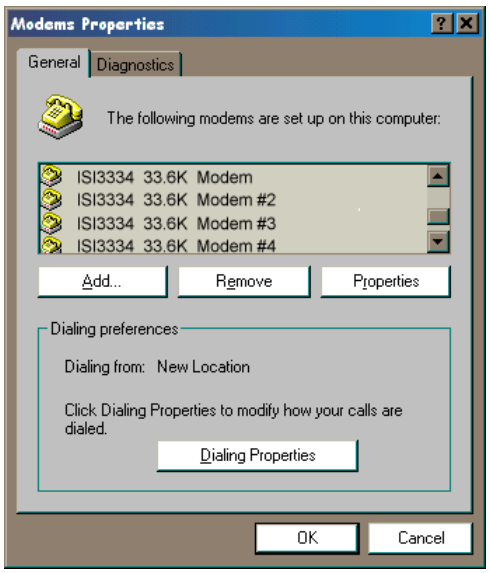
7. After the modem installs to the port, click **Finish.**


Install New Modem
Your modem has been set up successfully.
If you want to change these settings, double-click the Modems icon in Control Panel, select this modem, and click Properties.
< Back
Finish
Cancel

8. Return to the **General** tab to view COM port assignments (and make changes if necessary).



9. Click **Add** and repeat installation steps 3–8 to install modems
   - to the last three modem ports of the ISI3334/4, OR
   - to the last seven modem ports of the ISI3334/8.



Removing the ISI3334 Driver (Windows 95/98)

1. Click **Settings**, **Control Panel**, and then double-click **Add/Remove Programs**.
2. From the list box, select **MultiTech ISI Driver Device**.
3. Click **Add/Remove** and follow screen instructions.

NetWare Driver Installation

Multi-Tech Systems provides AIO drivers for the ISI3334 cards, so they can function with Novell compatible asynchronous applications (e.g., NetWare Connect). The AIO driver is simply an NLM (NetWare Loadable Module) that runs on the file server. Drivers must be loaded on the file server where the board is installed. Drivers can be loaded from the file server's console prompt or incorporated for autoloading in the AUTOEXEC.NCF file.

To install the Multi-Tech AIO driver, copy the file *AIOISIX.NLM* to the system directory of the file server from a workstation on the network. To copy, you can use the following command:

COPY E:\SERVCARD\DRIVERS\NOVELL\AIOSIX.NLM F:\SYSTEM

If you have downloaded the ISI driver from the MultiTech web site onto a diskette, use this command:

COPY A:\NOVELL\AIOISIX.NLM F:\SYSTEM

To load the driver, go to the system or PC console (where the ISI card is installed) and enter the following at the prompt:

LOAD AIOISIX [port=W] [interrupt=X] [name=Y] [note=Z]

To install the ISI card scripts, copy **aiomdms.mdc** to **f:\system\aio\directory**. Click **Yes** to overwrite the existing aiomdms.mdc file.

Configuring Ports for NetWare Connect

When the driver is installed, it will allocate consecutive ports for the ISI card as follows:

• 4 consecutive ports for the ISI3334-4.

• 8 consecutive ports for the ISI3334-8

To set up NetWare Connect ports, enter **LOAD NWCCON** at the NetWare console prompt. LOAD NWCCON opens the NetWare Connect Configuration Utility. Select the appropriate menu options (modem type, speed, flow control, etc.).

Removing the Driver (Novell)

In Novell, remove file AIOISIX.NLM from the system directory and make the appropriate changes to the *Autoexec.ncf* file.

Troubleshooting

Problem: I loaded the driver at the file server console, then I started NetWare Connect and connected a modem to a port on an ISI3334. When I try to communicate with the modem, I see the DTR of the modem being raised, but the modem does not respond to my AT commands.

Solution: There might be an IRQ conflict between an ISI3334 and some other hardware in your system. Even though that particular device (for example, a mouse) is not activated under NetWare, that device will still control the IRQ. See your system's documentation to find out how to disable that device.

SCO Open Server 5 Driver Installation

The ISI driver for SCO Open Server 5 is shipped on CD-ROM (FAT file system) and can also be downloaded from the Multi-Tech web site. In both cases, the driver files are compressed ("tarred"). Users installing from the CD-ROM should begin at "To install from CD-ROM" directly below. Users installing from a floppy disk should skip down to "To install driver from floppy disk" later in this section. The filename of the SCO5 driver in its tarred form is **isisco.tar**.

This present installation section is task-oriented with minimal explanation of procedural steps. The section *Multi-Tech Installation Script,* which immediately follows this section, presents additional details to aid in installation.

To install from CD-ROM:

mount -r /dev/cd0 /mnt

cd /mnt

cd servcard/drivers/sco50x

#cp isisco.tar /

cd <ENTER>

To format a floppy disk for SCO5:

1. At the Unix prompt, run the **scosh** program.
2. Select **Manager**.
3. Select **Archive**.
4. Select **Format**.
5. Make sure that Device is pointed to the floppy drive.
6. Select **Continue**.

To untar the driver file and copy files onto floppy disk:

1. Make a temporary directory for the ISI driver files..

   # mkdir /isi

2. Copy the tarred isi driver file into the temporary directory.

   # cp sco50x.tar /isi

3. Untar this file and put its contents into the temporary directory.

   # cd /isi

   # tar xf sco50x.tar

4. Copy the untarred (inflated or non-compressed) files to a floppy disk

   # cd /isi/unifiedinstimg

   #scosh

   - Select **Manager**.

   - Select **Archive**.

   - Select **Create**.

   - Press space bar to highlight tmp/ and usr/ directories.

   - Press <Enter> to copy.

- Make sure Device is pointed to the floppy disk.

- Make sure that the “Type” is cpio.

- Select **Continue**.

5. To verify that the files have been copied onto the floppy disk, use these commands:

scosh

- Select **Manager**.

- Select **Archive**.

- Select **List**.

- Make sure Device is pointed to the floppy disk.

- Select **Continue**.

To install driver from floppy disk

(Users starting with the untarred SCO5 driver on a floppy disk can begin the installation here).

1. Run the **custom** utility.

2. Select **Software**.

3. Select **Install New**.

4 Highlight driver file from local host and select **Continue**.

5. Select as the Media Device “Floppy Disk Drive.”

6. Select .

7. Highlight “Multi-Tech ISA/PCI ...” and select **Install**.

8. Enter **Y** (yes) to continue installing the ISI driver.

9. As many as four ISI cards can be installed in the server. Type 1, 2, 3, or 4, based on the number of ISI3334 cards you are installing in your system. Type the base I/O address and the IRQ value for each card. Be sure that the I/O address and the IRQ value match the values set in the DIP switch and jumper block on the ISI3334 card.

For further details see *MultiTech Installation Script* step 1.

10. Type the number of pseudo-devices to be created.
For the ISI3334-4, type 4.
For the ISI3334-8, type 8.
For further details see *MultiTech Installation Script* step 2.

11. Type **Y** (yes) to accept the prefix for tty ports. For further details see *MultiTech Installation Script* step 3.

12. Type **Y** (yes) to confirm the selection. For further details see *MultiTech Installation Script* step 4.

13. After the driver is installed, press <Enter> to continue. For further details see *MultiTech Installation Script* step 4(last paragraph) and step 5.

14. Exit the **custom** utility. For further details see *MultiTech Installation Script* step 6.

15. Remove the floppy disk and reboot your computer. For further details see *MultiTech Installation Script* step 7.

MultiTech Installation Script

The Multi-Tech Installation Script for SCO Open Server 5 systems requests information about how many boards you want to install, designations for communication ports and printer ports, and how many pseudo devices you want to create for Multi_View utility. Based on this information, the appropriate driver files will be installed and linked with your system's kernel.

1. This text appears on the screen:

   ```
   You can install up to four ISI3334 cards in a system.  Enter the number of
   ISi3334 cards you want to install and configure on your system (1-4):
   ```

2. The following text appears on the screen:

   ```
   Multi_View is a utility which will allow you to have multiple sessions on
   terminals that have multiple pages of physical memory.  In order for this utility
   to work with MultiTech's serial cards, pseudo devices have to be created in your
   /dev directory.  These devices are system-wide resources.

   Enter the number of pseudo-devices to be created for the use of Multi_View
   utility
   (1 - 256).
   ```

   The Multi_View utility initializes the multiple-page capability of terminals with multiple pages of memory. The number specified here is the total number of devices (between 1 and 256) available to all Multi-Tech terminals and it's the number of pseudo devices available to the Multi_View utility.

   Specify **4** pseudo devices for each ISI3334-4 card installed;
   specify **8** for each ISI3334-8 card installed.
   For example, if the computer contains three ISI3334-8 cards, you would enter **24**.

   Use the **enable** command to initialize ports (for example, `enable ttyl1a`).

3. This text appears on the screen and relates to the "/dev" directory.

   ```
   This script also creates the devices in your system to communicate with the ports
   of ISICOM.  The default prefix for the tty ports is ttyl.  The default prefix for
   the printer is prnl.  Is this acceptable? (y/n/q).
   ```

   For most users, it's best to select **y**, which entails accepting the default values. Then proceed to step 4.

   Details for use of non-default port/printer values. The /dev directory holds device-information files used by the kernel to access the hardware. When you add an ISI card, you must give the ISI ports unique names so they do not conflict with existing ports or with other devices known to your system. If a device name has already been assigned to an existing device and the operator assigns that name to a new device, then the existing device will be *deleted* when the ISI port using its name is created.

   a. To use a non-default base name, type **N** and then enter a basename having less than five characters. The base name you select will be used for all ports on each card you install. ISI port designations will have this form:
   [*basename prefix*][*board number*][*port letter*].

   basename: Length is one to four characters.
   board number: Values will be 1, 2, 3, or 4, depending on how many ISI cards are installed in your computer.
   port letter: For ISI3334-4, use letters A through D for modems. For ISI3334-8, use letters A through H for modems. (For terminal control devices, use lower-case letters as port identifiers.)

   Device basename selected: _____

   b. After you select a device basename, you are prompted for a printer base name. This prefix identifies each port that supports a terminal with a printer attached to its auxiliary port (for transparent printing). Specify a unique printer base name (printer parameters are outlined in the Multi_Setup Utility section in this manual).

   Printer base name selected: _____

When you have specified the device base name and the printer base name, press **Enter** to continue.

4. The confirmation screen lists the values you have selected. The following text appears on the screen (default values are shown):

```
You have chosen the following setup
The tty prefix is ttyl.
The printer prefix is prnl.
Number of Multi_View pseudo devices                    [user-specified number].
```

If these values are correct, type **Y** and the installation process will continue. If there is an error in any of the values displayed, type **N** and the first screen displays. Then re-enter the information for each card.

When you accept the confirmation list (by typing **Y**), a series of messages displays while the driver is being installed and the kernel rebuilt. After the terminals have been added to the Terminal Control database, and when the display says "**Press <Enter> to continue**:", then press **ENTER**. When **Installation complete** displays, press **ENTER** again.

5. Select **Host** and press **ENTER** . Remove the diskette from the drive.
6. Select **Exit** and press **ENTER** .
7. To reboot the system (required), enter the following commands:

Type **shutdown -g0-y** and press **ENTER**

OR

Type **init 6** and press **ENTER** .

Driver installation for the ISIHP card now is complete.

Activating Ports in SCO Open Server 5

SCO Open Server 5 provides a device database that monitors the activity of serial ports through which users can log onto the host. If your ISI ports are used by terminals (e.g., to allow users to log onto your host), you must create an entry in the system's device database that furnishes specific information for the terminals that will be used on each ISI port. The database is referenced each time a user attempts to log in. If there is no database entry for a particular terminal, access to the host is denied.

1. Turn on your system and verify that the firmware for each ISI3334 card loads successfully. If the firmware for any ISI3334 card does not load, none of its ports will be accessible. (If this happens, see *Multi-Tech's Administrative Utility* section in this manual.)
2. Type the complete name of the first device you want to create in **usr/lib/uucp/Devices**. Substitute the specific base name, board number, and port letter for the generic parameters in the expression **ttylbx**. Use a lower-case **x** value for local DTE (terminal) support and an upper case **X** value for modem control for each port you want to enable. Example: **ttyl2A** denotes the second ISI card (2) and the first port on that card (A). The port status can be altered later, but one setting must be selected at this time. The ACU line would read as follows:
ACU ttylbX - 9600 ***dialer name***. Replace **b, X** and **dialer-name** with appropriate values.
3. Repeat this process for each port on each board you have installed. **Record the setting you select for each port.**
4. Using device names created in the previous section, type the following command for each port you want to activate:
enable ttylbx
5. Repeat this command for each port you want to activate, using the lower case letter for local terminal use or upper case for modem control.

Note: *Only one of the options (e.g., modem control or local terminal access) should be enabled for any port at one time. For example, you cannot enable* `ttyl1a` *and then enable* `ttyl1A`*. To change the status of a port, disable the current status (*`disable ttyl1a`*) and then enable it for the desired status (*`enable ttyl1A`*).*

Multi_Setup Utility

This section guides you through the Multi-Tech Setup Utility for SCO Open Server 5.0 systems. The Multi_Setup utility lets you set various parameters for Multi-Tech's ISI card ports, such as transparent printing options, high baud settings (above 38400 bps), and hardware flow control. All the changes made by the Multi_Setup utility are in effect until the system is rebooted or until the option is changed using Multi_Setup.

Multi_Setup has a database of “on” and “off” strings for the transparent printing option through commonly-used terminal emulations. If terminal type in use is not recognized by Multi_Setup, Multi_Setup checks the *termcap* database to extract the “po” and “pf” escape sequences for transparent printing through that terminal type.

The following are Multi_Setup options:

Command-line Options	**Feature**
-h	Prints the Help file.
-a	Displays current setting for printer configuration options.
-c cps	Specifies the printer speed in characters per second. Default value of 100 cps.
-b bufsize	Specifies the buffer size for transparent printing. Valid range is any integer greater than 0, as specified by your printer. The default value is 250 characters.
-T term	Sets the transparent printing escape sequences to that of the terminal specified by term. This parameter has access to the look-up table in the terminal database built into Multi_Setup. If the terminal is not recognized by Multi_Setup, then the termcap database is used to find the On and Off escape sequences for transparent printing.

Command-line Options	**Feature**
-n tty	Specifies the **tty** port. If **tty** is not specified, then the operation is carried on the standard input terminal.
-B high/low	“-B high” sets the ISI port baud rate to the high settings (see the conversion table below). “-B low” returns the ISI port to standard baud settings. **Port Hardware Operates at:** 300 bps 57600 bps 1200 bps 115200 bps
-f cts/nocts	“-f cts” forces hardware flow control on the ISI port, overruling application software settings where applicable. “-f nocts” allows the hardware flow control setting to be determined by the application software.
-s string	Sets the “on” and “off” strings for transparent printing. These strings must be specified in the same order and both strings must be specified. Unprintable control characters must be entered as three octal digits with padded zeros, if necessary, and be preceded by a "\". For example, the escape character can b entered as \033. The “on” and “off” strings can be specified within the quotes as a string or as two strings separated by a comma. -s “\022\011C \022\011\D or -s “\022\011C”, “\022\011\D”

Multi_View Utility Installation

This section guides you through the Multi_View Utility for SCO and UNIXWare systems. During the installation of the ISI3334 drivers, you will also install the Multi_View utility for multiple-page terminals. This section profiles the Multi_View utility and gives you the necessary information to create a Multi_View information file.

Once installed, Multi_View can be invoked by typing the following command:

Multi_View [options]

The Multi_View initializes the multiple-page capability of terminals with multiple pages of memory. While Multi_View works even on a dumb terminal (without multiple pages of memory), your terminal(s) should have multiple pages of memory and be capable of retaining the position of the cursor on each page to get the proper effect.

Most state-of-the-art terminals have multiple pages of memory, which allow them to switch between sessions. Each page of memory available on the terminal allows its user to establish another session on the host. The multiscreen capability of the terminal stores the screen information and the cursor position for each session to a different page of memory.

Multi_View allows the host to process the session-switching hot keys and issue the necessary escape sequence to the terminal so that the appropriate page is displayed on screen. Multi_View treats each new screen opened by the user as a virtual screen and maintains mapping between each virtual screen created and a page of memory on the terminal. The number of virtual screens and pages of memory available are dependent on the terminal emulation, the particular terminal being used, and the number of pseudo devices created by the system administrator during installation.

In an ideal case, there can be as many virtual screens as there are pages of memory on the terminal. If there are more virtual screens specified than there are pages of memory, then two virtual screens may be mapped to a single page of memory, in which case, both sessions' screens are displayed when that page of memory is recalled.

Once Multi_View is successfully able to read the terminal description and initialize the terminal, it comes up with a message displaying the hot-key sequence for "help".

The following hot keys are defined:

- Go to n^{th} virtual screen
- Create new virtual screen
- Switch between current and previous screens
- Provides help on hot keys
- Quits Multi_View with an exit status of zero
- Ends Multi_View with a non-zero exit status

To define your own terminal capability database, see the Description File Format section below.

The following options are defined:

Options	Description
-h	Prints the help file. Multi_View uses the environment variable MTDSPLY to choose the utility to display this file. If no such variable is found in the environment, then Multi_View uses the “pg” utility.
-t	This option is used to inform Multi_View to use a terminal description that is different from the one specified by the TERM variable in the user environment.
-f	This option lets the user instruct Multi_View to read the terminal descriptions from a different file than the default description file. The default description file is “*usr/bin/msfile*”.

Description File Format

A description file may contain descriptions for multiple terminal types. Each terminal entry should be separated by a blank line. The first line for each terminal contains the various names by which that terminal is known. There are three types of entries for each terminal emulation: 1) hot key entries, 2) terminal escape sequences, and 3) timing specifications.

Hot Key Entries

These entries have three columns. The first column specifies a mnemonic. Each mnemonic is associated with a specific action taken by Multi_View. The mnemonics are as follows:

Mnemonic	Description
vs	Identified the virtual screen entry. An entry will be present for each virtual screen that needs to be opened by Multi_View.
sw	Identifies the hot key sequence for switching between two virtual screens.
cm	Identifies the hot key sequence that instructs Multi_View to create a new virtual screen.
lm	Identifies the hot key sequence for displaying help on the hot keys.
qm	Identifies the hot key sequence to exit Multi_View with a zero exit status.
em	Identifies the hot key sequence to exit Multi_View with a non-zero exit status.

The second column contains the keystroke sequence that needs to be pressed to make the action described by the mnemonic in the first column to take place.

The third column specifies the escape sequence sent by the terminal to Multi_View when the key combination specified in column two is pressed.

In other words, these entries tell Multi_View that the terminal sends the escape sequence specified in column three to Multi_View when the keystrokes specified in column two are pressed and that Multi_View should take the action specified in column one whenever it receives the characters specified in column three.

Terminal Escape Sequences

The terminal escape sequence entries describe the escape sequence that needs to be sent to the terminal. The first column contains a mnemonic. The mnemonics are described below:

Mnemonic	Description

ps	Describes the escape sequence that needs to be sent to the terminal to switch to the appropriate physical page. The physical pages are numbered in the order they are specified in the description file.
clear	Specifies the escape sequence to clear the screen.

The second column has the character sequence that needs to be sent to the terminal by Multi_View.

Timing Specification

The timing specification is the interval in tenths of a second that the utility waits before checking for an escape sequence. The timing specification is defined below:

Mnemonic	Description
time	Specifies the interval, in units of 0.1 seconds, Multi_View will wait while reading characters before checking for escape sequences.

A sample file for the Wyse50 terminal is provided in the following example:

```
wy50  wyse50  w50                          ; line 1
      vs    shift_F1   \001'  \015         ; line 2
      vs    shift_F2   \001a\015           ; line 3
      sw    shift_F3   \001b\015           ; line 4
      cm    shift_F4   \001c\015           ; line 5
      cm    shift_F5   \001d\015           ; line 6
      lm    shift_F6   \001e\015           ; line 7
      qm    shift_F7   \001f\015           ; line 8
      ps               \033w0              ; line 9
      ps               \033w1              ; line10
      clear            \033+               ; line11
      time             1                   ; line12
```

Line 1 Gives all the different names that the Wyse50 terminal is known.

Line 2 Specifies the virtual screen 0 settings. When the help screen is displayed, <Shift>+<F1> is displayed for the virtual screen 0. The entry means that the terminal is going to send a string with the first ASCII character being start of header (01 Hex), second character a hyphen (-), and the last character a carriage return <CR> when <Shift>+<F1> is entered on the terminal and that Multi_View is switched to the shell/process associated with virtual screen 0.

Line 3 Specifies the entry for virtual screen 1.

Lines 4-8 Describes the hot keys to switch between the current and previous virtual screens, create a new virtual screen, display the help on the hot keys, quit Multi_View with a zero exit status and end Multi_View with a non-zero status respectively.

Lines 9,10 Describes the physical pages on the terminal. The second string on each line gives the escape sequence that needs to be sent out to the terminal to switch to the appropriate physical page.

Line 11 Clear string to clear the screen.

Line 12 Specifies at least a 0.1 second wait in reading data before going ahead and check for hot keys.

Each character in the escape sequence or hot key can be specified as an ASCII character if it is printable. If not printable, then it should be specified in an octal format with leading 0's, if needed, and preceded by a "\". For example, an ASCII escape character can be specified as "\033".

Do not switch the screen while outputting as it may break the escape sequence sent to the terminal. When there is more than one virtual screen, all outputs from the inactive virtual screens will be blocked. The virtual screen the user is currently working on is the only active screen.

The fullest potential of Multi_View is realized on a multiscreen terminal; however, Multi_View can be used on a dumb terminal that has only a single page of memory. When there is only one page, the screen output is

unavoidably garbled from different virtual screen outputs.

Some important ASCII unprintable characters and their octal values are listed below.

SOH (^a)	\001	STX (^b)	\002
ETX (^c)	\003	EOT (^d)	\004
ENQ (^e)	\005	ACK (^f)	\006
ESC (^[)	\033	Newline (NL)	\012
Carriage Return (CR)	\015		

Some known limitations are presented in the following listing:

- No null characters are allowed in the hot keys.
- No hot key can be a complete substring of another hot key.

Administration Utility

Multi-Tech also provides an administrative utility called "*Multi_Admin*" which aids in troubleshooting Multi-Tech's multiport boards. This section guides you through the Administration Utility for SCO and UNIXWare systems. This interactive menu utility displays various types of Multi-Tech's multiport boards that may be installed in your system. You can specifically observe the status and statistics of any installed multiport board or any of its ports (e.g., MultiClusterU, ISI3334 or ISI4608).

This utility periodically updates the statistics and status information for selected board and/or ports. The displayed statistics are self-explanatory.

The **-v** option provides detailed information and can be used to analyze problems when calling Multi-Tech's technical support:

Usage: Multi_Admin [-v]

While you can view statistics and status on-screen, you can also store them to a log file and fax the log to a technical support member at Multi-Tech to troubleshoot.

Removing the Driver (SCO Open Server 5)

To remove the Multi-Tech Serial Card Driver, enter the configuration utility (e.g., custom for SCO Open Server 5) and follow instructions to remove the entire driver and rebuild the kernel without the ISI driver. If it is necessary to reinstall the driver due to I/O address or IRQ overlap, remove the driver first.

Note: Remove the driver before permanently removing the ISI card from the computer.

Linux Driver for ISI3334 Server Cards

LINUX: Pre-Installation Issues

When unpacking the Linux driver, there may be two choices, one for the 2.0.x kernel, and one for the 2.2.x kernel, (ex linux22x.tar). Be absolutely positive about which kernel you have!

The 'make' utility, GNU C compiler, and the kernel sources need to be installed on your system. If any of these are missing, the compilation will fail. Most later Linux OSs install these elements automatically .

LINUX: Copying the driver from the media

The Linux drivers (2.0 and 2.2 kernel) are shipped in compressed ('tarred') form on a CD-ROM formatted with the FAT file system. In some cases, users may download Linux ISI drivers from the MultiTech web site onto diskette (in ext2 format). We present instructions for both situations below.

LINUX: Copying and untarring the driver from CD-ROM

1. Mount the CD-ROM using this command:

   mount /mnt/cdrom

2. Change directory

   cd /mnt/cdrom

3. List the files on the CD-ROM and locate the directory for the kernel in use (2.0 or 2.2), using this command

   ls

4. Untar the appropriate Linux driver using this command:

> tar vxf *{filename}*/tmp

At this writing, the filename will be either LINUX20X.TAR or LINUX22X.TAR.

LINUX: Copying and untarring the driver from a floppy

The ISI driver *.tar* file can be copied from a DOS formatted floppy using the 'mcopy' command if the 'mtools' have been installed. Issue 'mcopy a:isilinux.tar <destination folder>' to copy the isilinux.tar (or current driver name) file to the destination folder. As an alternative, the floppy can be manually mounted and the file copied to the required destination folder.

NOTE: To read from a DOS formatted floppy, a kernel with support for the FAT file system (either statically linked in the kernel or as modules) is required.

Steps for copying the driver from a floppy:

1. Linux floppy disks are in ext2 format.
2. Insert Linux driver in drive A: and mount floppy drive.

   > mount /dev/fd0

   > mount -t ext2 /dev/fd0 /mnt/floppy

3. Copy files from floppy to a temporary directory on hard drive.

   > mkdir /isi

   > cd /isi

   > cp /mnt/floppy/kernel_2.2.x/* /isi

After you have copied the installation tar file to a folder, use the command 'tar xvf isilinux.tar' to untar (unzip or de-compress) the installation files in that folder.

LINUX: Driver installation and loading

Execute the 'Install' script to build the driver and to copy the driver and firmware files to the required folder.

> cd /isi

> ./Install

The installation script requires the user to type in the I/O address and the IRQ to be used. The installation creates the script file 'ISICOMStart' in the destination folder. 'ISICOMStart' automates the loading process for the driver and firmware.

To view busy I/O address space on your system, enter
cat/proc/ioports

To view busy IRQs, enter:
cat /proc/interrupts

You must load the driver before you can load the firmware. You can load the driver manually using the 'insmod' utility. For ISI cards with the ISA bus, the I/O base address and the IRQ required by the card also need to be passed as parameters to insmod (this does not apply to ISI cards with the PCI bus).

insmod isicom io=card1, ... card4 irq=card1, ... card4

You can manually load the firmware into all of the installed ISI cards simultaneously by executing the 'frmld' utility in the installation folder. The firmware to all the installed cards can be manually loaded by executing the 'firmld' utility in the installation folder. This utility requires the firmware files (.bin) to be located in the /usr/local/ISICOM/ folder.

LINUX: Setting the baud rate

The 'stty' utility can be used to set the baud rate of a particular port. For example, to set the baud rate of the first port on the first card (ttyM1a) to 38400 bps, execute 'stty 38400 < /dev/ttyM1a'.

The current baud rate can be viewed by executing 'stty < /dev/ttyM1a'.

LINUX: Verifying the ports

Terminal utilities like 'minicom' can be used to verify the ports, 'talk' to the modem, and dial out.

To configure 'minicom' for a particular port, run it with the '-s' option. In the 'serial port setup' menu option, set the serial device to the required ISI port device (for example, '/dev/ttyM1a' for the first port on the first card). Save the configuration for a particular port using the 'save setup as' menu option as, for example, '1a' for the port /dev/ttyM1a. To connect to the port /dev/ttyM1a using minicom the next time, 'minicom 1a' needs to be executed.

LINUX: TTY Devices Created by the Drivers:

Device files corresponding to ports on the ISI card are created in the **/dev** folder. Use **ttyMxy** for normal ports and **cumxy** for corresponding callout ports. Normal ports (**ttyM**) are configured for dial-in connections. Callout ports (**cum**) are used for dial-out connections.

In these expressions (**ttyMxy** and **cumxy**), the letter **x** is the card number (1-4), and **y** is the port designator (a, b, c, ...).

The ISI Linux driver creates the following TTY devices in /dev directory:

- /dev/ttyM1a TO /dev/ttyM1p for the first ISI card

- /dev/ttyM2a TO /dev/ttyM2p for the second ISI card

- /dev/ttyM3a TO /dev/ttyM3p for the third ISI card

- /dev/ttyM4a TO /dev/ttyM4p for the fourth ISI card

For 4-port cards, it uses the following:

- /dev/ttyM1a TO /dev/ttyM1d for the first ISI card

- /dev/ttyM2a TO /dev/ttyM2d for the second ISI card

- /dev/ttyM3a TO /dev/ttyM3d for the third ISI card

- /dev/ttyM4a TO /dev/ttyM4d for the fourth ISI card

For 8-port cards, it uses the following:

- /dev/ttyM1a TO /dev/ttyM1h for the first ISI card

- /dev/ttyM2a TO /dev/ttyM2h for the second ISI card

- /dev/ttyM3a TO /dev/ttyM3h for the third ISI card

- /dev/ttyM4a TO /dev/ttyM4h for the fourth ISI card

Devices mapped for Hybrid cards (ISI3334-4 and ISI3334-8 cards):

For the four-port cards (ISI3334-4):

- /dev/ttyM1a to /dev/ttyM1d *for modem ports.*

For the eight-port card (ISI3334-8):

- /dev/ttyM1a to /dev/ttyM1h *for modem ports*.

LINUX -- Dial-in configuration:

To configure a particular port for dial-in, utilities like 'mgetty' need to be installed on the system. If, for example, the port /dev/ttyM2c needs to be configured for a remote-access dial-in connection, an entry of the form 'M2c:12345:respawn:/sbin/mgetty ttyM2c' needs to be added in the /etc/inittab file. After you have made the change, execute 'init q' so that the 'init' process re-reads the inittab file and spawns the mgetty process to wait for an incoming connection. Users can then dial in, use their user names and passwords to log in, and access their accounts on the machine.

To disable dial-in access on a particular port, change the entry in the /etc/inittab file to 'M2c:12345:off:/sbin/mgetty ttyM2c'or just comment-out that entry by prefixing a '#' to the entry on the line.

LINUX -- PPP setup:

The 'PPP-HOWTO' (a document that is available as a part of the 'HOWTO' documentation on most of the distributions under /usr/doc/HOWTO) explains in detail the procedure for configuring a Linux machine as a PPP server. This information is also available at

http://www.interweft.com.au/other/ppp-howto/ppp-howto.html.

The documentation in the PPP-HOWTO is directly applicable to ISI ports.

Note: *A base I/O address of 0, e.g., ISIBaseX=oxo, or omission of these parameters for any card X, disables that particular card.*

Miscellaneous:

Device files corresponding to ports on the ISI3334 cards are created in the **/dev** folder. Use **ttyMxy** for normal ports and **cumxy** for corresponding callout ports. The letter **x** is the card number (1–4), and **y** is the port number, (a–p) for 16-port cards.

Normal ports (**ttyM**) are configured for dial-in connections. Callout ports (**cum**) are used for dial-out connections.

To view busy I/O address space on your system, enter:

cat /proc/ioports

To view busy IRQs, enter:

cat /proc/interrupts

To load the driver manually, use **insmod**.

Example: To load two ISI cards configured with base I/O addresses 0x210 and 0x200 and IRQs 5 and 10, enter the following in the destination folder:

insmod isicom
ISIBase1=0x210
Irq1=5
ISIBase2=0x200
Irq2=10

To remove the driver manually, enter **rmmod isicom**. This removes the driver only if no ISI ports are in use.

Removing the ISI Driver (Linux)

1. Type cd /usr/local. Press Enter.
2. Type rm -r ISICOM. Press Enter.
3. This will remove driver for all ISI3334 cards in that Linux server.
4. Remove the isictl file by typing “rm isictl” in the /dev directory.
5. Remove all devices that start with ttyM1x, ttyM2x, ttyM3x and ttyM4x in the /dev directory.

   “rm ttyM1*”

   “rm ttyM2*”

   “rm ttyM3*”

   “rm ttyM4*”

Intelligent Serial Interface

Chapter 3 - Service, Warranty & Tech Support

MultiTech® Systems

Introduction

This chapter starts out with statements about your MultiModemISI's 2-year warranty. The next section, Tech Support, should be read carefully if you have questions or problems with your MultiModemISI. It includes the technical support telephone numbers, space for recording pertinent information, and an explanation of how to send in this product should you require service. The final sections explain how to use our web site.

Multi-Tech Warranty & Repair Policies

Multi-Tech Systems, Inc., (hereafter "MTS") warrants that its products will be free from defects in material or workmanship for a period of two, five, or ten years (depending on model) from date of purchase, or if proof of purchase is not provided, two, five, or ten years (depending on model) from date of shipment. The ISI3334/4 and ISI3334/8 carry a two-year warranty.

MTS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by Customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory — transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES, AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PRICE FOR DEFECTIVE PRODUCTS.

Addendum for North American Products

In the event that service is required, products may be shipped, freight prepaid, to our Mounds View, Minnesota, factory (Multi-Tech Systems, Inc., 2205 Woodale Drive, Mounds View, MN 55112, Attn: Repairs, Serial #_____). A Returned Materials Authorization (RMA) is not required. Return shipping charges (surface) will be paid by MTS. Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), a telephone number, and if the product is out of warranty, a check or purchase order for repair charges. If possible, note the name of the technical support specialist with whom you spoke. Repair charges vary according to product. At this printing, the standard repair charge for ISI3334 cards is $100. Repair prices are subject to change without notice.

Extended two-year overnight replacement agreements are available for selected products. Please refer to our Overnight Replacement Agreement for details on rates and coverages.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department at 1-800-972-2439. Please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at (800) 328-9717 or (763) 717-5631.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Addendum for International Products

Distributors should contact Amex, Inc., for information about the repairs for your Multi-Tech product.

Amex, Inc.
2724 Summer Street NE
Minneapolis, MN 55413 U.S.A.
Tel: +(612) 331-3251
Fax: +(612) 331-3180

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department nearest you. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at +(763) 717-5631 in the U.S.A., or a nearby Multi-Tech office which is listed on the "Multi-Tech Corporate Offices" sheet in this International Distributor Resource Kit.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Recording MultiModemISI Information

Please fill in the following information on your Multi-Tech product. This will help tech support in answering your questions.

Serial No.: _____
Firmware Version: _____
Driver Type/Version: _____
COM Port #: _____
IRQ Setting: _____

Please note the status of your MultiModemISI before calling tech support (e.g., screen messages, diagnostic test results, problems with a specific application, etc). Use the space below to note status:

~Notes~

Out of Warranty Repair Cost Charts email Repairs

For current out-of-warranty repair costs, visit the MultiTech web site (www.multitech.com).

Multi-Tech's Internet presence includes a Web site at:

http://www.multitech.com

and an ftp site at:

ftp://ftp.multitech.com

Intelligent Serial Interface

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